

Appl. No. 10/806,818  
Response to Office Action mailed October 18, 2006

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Claims 1, 2, 11 to 13, 15, 18, 19, 23 and 25 to 27 were amended to include features from claim 3 ("color ink" and "reaction liquid"). Minor editorial revisions were made to claim 1 (i.e., changing "separate" to --separately--).

Applicants' present claim 1 concerns an ink for ink jet comprising:

a color ink containing a solvent which is polymerizable in the presence of an acid and a colorant dispersed in the solvent; and

a reaction liquid containing a photo-acid generating agent which is capable of generating an acid as it is irradiated with light and prepared separately from the color ink, the reaction liquid being preserved separately from the color ink.

Claims 1, 2, 11 to 14, 17, 18 and 23 to 28 were rejected under 35 USC 102 as being anticipated by EP 779346 to Mantell et al. for the reasons set forth in item no. 5 on page 4 of the Office Action.

Claims 15, 16, 19 to 22 and 24 to 27 were not included in this rejection.

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It is respectfully submitted that the ink of applicants' present claim 1 is not disclosed or suggested in Mantell et al. (EP 779346).

Mantell et al. disclose only as follows in column 10, lines 26 to 30:

"In another embodiment of the present invention, the initiator used in the process of curing the ink may be kept separate from the curable ink composition until the ink is ejected from the orifice to form an image on the substrate."

As seen in applicants' present claim 1, the ink comprises a specific color ink and a reaction liquid. The color ink contains a solvent which is polymerizable in the presence of an acid and a colorant dispersed in said solvent. The reaction liquid contains a photo-acid generating agent which is capable of generating an acid as it is irradiated with light and prepared separately from said color ink, said reaction liquid being preserved separately from the color ink.

An ink comprising such color ink and reaction liquid as recited in applicants' claims is not described in Mantell et al.

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Accordingly, it is respectfully submitted that applicants' present claim 1 (and all the claims which depend directly or indirectly on claim 1) patentably distinguish over Mantell et al. It is therefore respectfully requested that the rejection under 35 USC 102 be withdrawn.

Claims 1, 2 and 11 to 28 were rejected under 35 USC 103 as being unpatentable over EP 1 357 159 to Ushirogouchi et al. in view of EP 779346 to Mantell et al. for the reasons set forth on page 2 of the Office Action.

It was admitted in the Office Action that Ushirogouchi et al. do not expressly teach preparing and preserving the photo-acid generating compound as a separate solution. Advantageous results for separately preserving the reaction liquid and the color ink are seen by the results set forth in Table 2 on page 75 of the present specification, which is reproduced hereinbelow.

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Table 2

| Sample No. | Pencil hardness | Curing property | Preservation         |                        |
|------------|-----------------|-----------------|----------------------|------------------------|
|            |                 |                 | Preserved separately | Preserved as a mixture |
| 1          | <2B             | x               | o                    | o                      |
| 2          | HB              | Δ               | o                    | o                      |
| 3          | H               | o               | o                    | Δ                      |
| 4          | H               | o               | o                    | x                      |
| 5          | H               | o               | o                    | x                      |
| 6          | H               | o               | o                    | x                      |
| 7          | H               | o               | x                    | x                      |

The shelf life was evaluated on two different kinds of ink, i.e., one where the first solution and the second solution were separately preserved, the other where these two solutions were mixed together and then preserved.

o: less than 20%

Δ: 20% to less than 25%

x: 25% or more, or deposit generated.

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With respect to the pencil hardness, samples exhibiting H or more were assessed as acceptable, and with respect to the shelf life, samples exhibiting A or more were assessed as a practically useful level.

As shown in the above Table 2, in the case where the ink was preserved subsequent to the mixing of the first and second solutions, the mixing ratio of the photo-acid generating agent is required to fall within the range of 2 to 4% in order to secure a practically acceptable curing property and shelf life. Whereas in the case where the first and second solutions were separately preserved, even if the photo-acid generating agent is added at a mixing ratio ranging from 2 to 20%, it is possible to secure a practically acceptable curing property and shelf life.

Mantell et al. was discussed above.

Attention is directed to the following paragraph from page 80, lines 15 to 25 of the present specification, which sets forth features and results of applicants' claim 1 that are not taught or suggested by Ushirogouchi et al.:

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"It will be recognized from these results that as long as the photo-acid generating agent and the polymerizable compound which can be polymerized in the presence of an acid are separately preserved and both components are mixed together to form a recording ink immediately before the formation of an image, thus enabling the ink to be discharged from an ink jet recording head, it is possible to constantly deliver a recording ink having a stabilized viscosity to the ink jet recording head, thereby making it possible to obtain stabilized printing characteristics."

The desirable results of applicants' present claim 1, which are described above, cannot be obtained from the disclosure of Ushirogouchi et al.

As is described on page 4, line 26 to page 5, line 1 of the present specification (which is reproduced hereinbelow)), the photo-cationic curing type inks for an ink jet are poor in shelf life and hence short in useful life:

"Photo-cationic curing type inks for ink-jet containing an oxirane group-containing compound, an oxetane ring-containing compound, a vinyl ether compound, a pigment, a pigment-dispersing agent, photo-acid generating agent and other additives are liable to indicate a great magnitude of fluctuation in viscosity (increase in viscosity) with time due to the dark reaction of the inks for an ink jet which would take place quite prominently. Therefore, the photo-cationic curing type inks for an ink jet are poor in shelf life and hence short in useful life."

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In contrast to the above, the ink of the present claims is excellent in shelf life and capable of reliably obtaining high-quality printed matter, with excellent reproducibility.

Applicants' present claims thus afford significant desirable results over Ushirogouchi et al.

Since, as discussed above, Mantell et al. do not teach or suggest the color ink and reaction liquid recited in applicants' claims, it is respectfully submitted that one of ordinary skill in the art would not consider combining the disclosures of the references.

Withdrawal of the 35 USC 103 rejection is thus respectfully requested.

In summary, it is therefore respectfully submitted that applicants' claims are not anticipated and are not rendered obvious over the references, either singly or combined in the manner relied upon in the Office Action, in view of the distinctions discussed hereinabove. It is furthermore submitted that there are no teachings in the references to combine them in the manner relied upon in the Office Action.

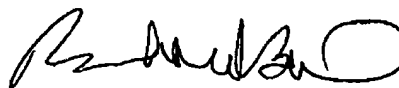
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Reconsideration is requested. Allowance is solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

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Respectfully submitted,



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